

TIPS FOR SUCCESSFUL IMPLEMENTATION OF ENERGY SYSTEM OPTIMIZERS

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Session C3 - Plant Energy Optimization

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Agenda

- Introduction
- Technical Issues - Define Needs
- People Issues - Potential Pitfalls
- Getting a program going and avoiding the pitfalls

Introduction

- The incentive for successful implementation is ongoing energy cost savings in the 2- 5% range, plus associated benefits.
- The penalty for failure is 'another' abandoned piece of software and loss of credibility with management that will impact future energy cost reduction efforts.
- The discussion will focus more on the qualitative aspect of implementation as opposed to technical aspects.

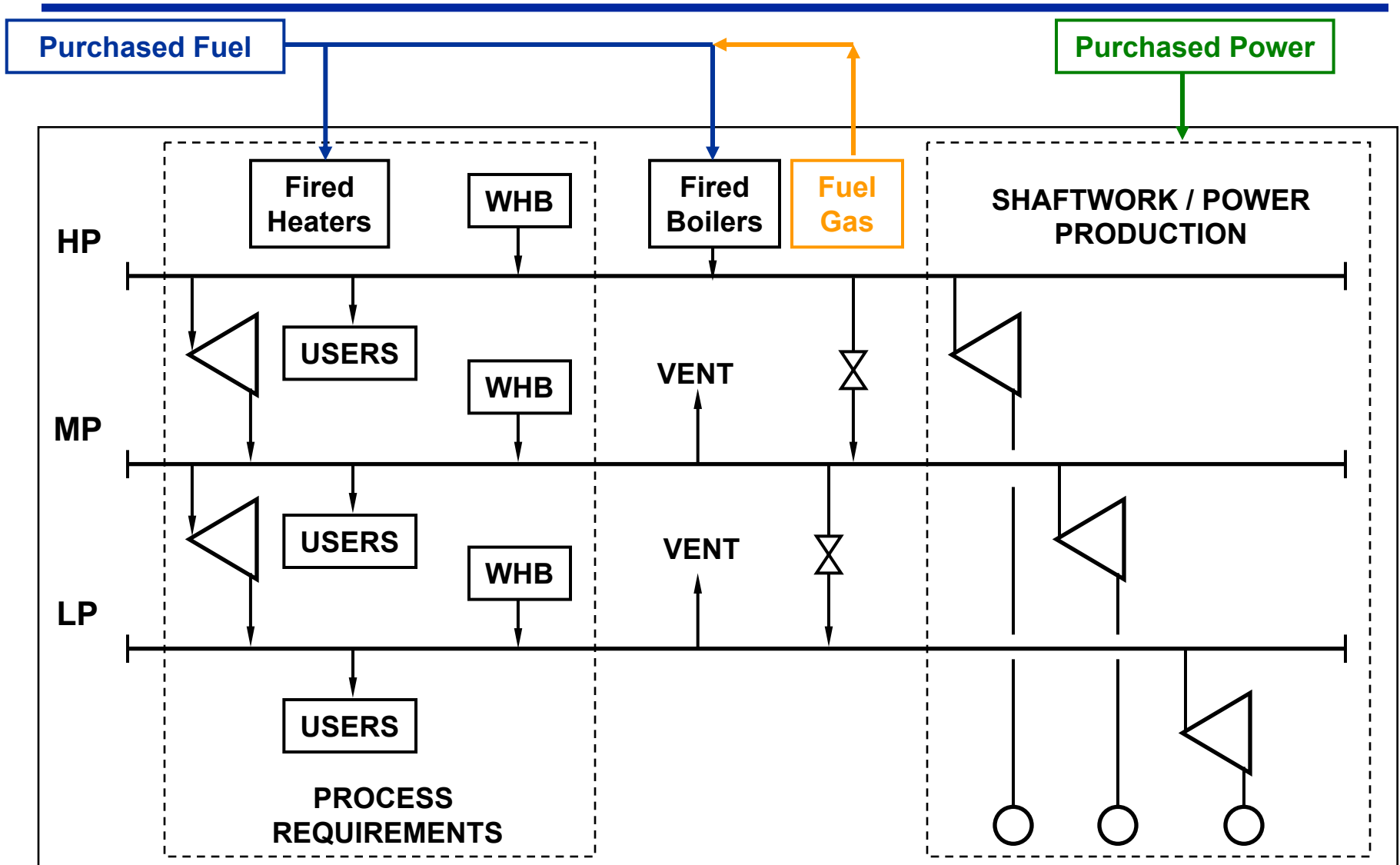
Energy System Optimization - what are we talking about ?

- Energy system optimization means different things to different people.
- For the purpose of this discussion we're talking about a tool to help manage and reduce purchased energy costs in the steam, fuel and power systems, on a site wide basis.

What might you want such a system to do ?

- Make regular recommendations for operating changes that result in cost savings
- Manage and distribute performance data and recommendations to multiple levels of staff in an organization – using the appropriate ‘language’
- Provide easy access to current and historical operating and performance data.
- Provide a simple means for modeling ‘What-if’ scenarios
- Provide a means of forecasting energy needs for budgeting, contracting and planning purposes

Why do Cost Reduction Opportunities Exist ?



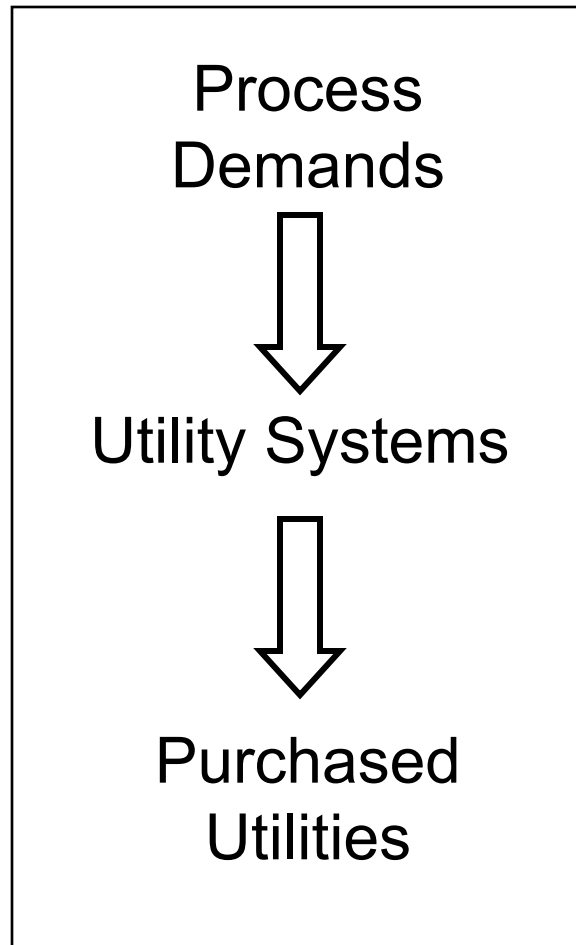
What types of actions can optimizers identify?

- Changes to equipment that result in savings on a regular basis.
 - i.e. Minimum cost equipment dispatch
- Actions that remove constraints preventing low cost operation
 - i.e. justification for repair or debottlenecking of turbines or motors that would provide additional flexibility
- Changes to operating practices that currently 'lock in' inefficient operation
 - i.e. slow rolling turbines

Defining Needs - What are you really trying to accomplish?

- The goal is to reduce purchased energy costs - Energy System Optimizers are not the only tools available for getting savings.
- A thorough evaluation of your site systems and needs provides a good basis for deciding what you need.
- Don't lose sight of where savings will come from! Focus efforts accordingly.

Defining Needs - What are you really trying to accomplish?



Savings can be found in each category

Considerations:

- Complexity
- Constraints
- Variability

The best place to focus is site and situation dependent

Examples of approaches in different environments

Site 1: Overview

- Large, complex system
- Over 150 turbines, over 75 of them with alternate drives
- Venting Steam
- Apparently plenty of flexibility to eliminate steam venting by optimizing turbine operations

Examples of approaches in different environments

Site 1: Conclusions

- Operating practices severely limited flexibility - particularly requirements related to turbine operations for mechanical and operational reliability.
- Some scope to reduce venting via optimizing turbine operations.
- Key priority - introducing additional flexibility into system;
 - Review / Revise operating practices
 - Implement selected projects to reintroduce flexibility lost due to equipment failures.

Examples of approaches in different environments

Site 2: Overview

- Large, complex system
- Apparent flexibility in turbine drive selection - but most of it in turbines supplied by medium and low pressure headers

Examples of approaches in different environments

Site 2: Conclusions

- Major compressor drives supplied by highest pressure header.
- Changes to demand at lower pressures has limited impact on high pressure demand.
- Available flexibility not in the right place to be most advantageous, but some optimization possible.
- Key Priority - Implement structural changes to introduce flexibility at the right points.

Defining Needs Helps Overcome Common Objections

- Commonly encountered objections
 - Our system is too complex
 - Our system is too simple
 - We don't have enough metering and what we do have is unreliable
 - The savings are too hard to verify
- The up-front needs assessment discussed earlier provides a good method for tackling objections.

Potential Pitfalls

Organizational and technical pitfalls' exist:

- Unreasonable expectation for benefits
- Operations Staff Involvement
 - Insufficient training
 - Performance data not accessible by operators
 - Not enough feedback on successes
 - Value of implementing recommended actions not communicated correctly
 - System not usable by console operators

Potential Pitfalls

- System Management
 - Ownership of, and responsibility for, running the system not clearly defined
 - Insufficient resources made available to develop, operate and maintain the system
- Lack of data
 - Meters – not enough / accuracy questionable
 - Equipment status not available on timely basis

Getting a program going and avoiding the pitfalls

- Understand your particular situation.
 - Up-front work needs assessment
 - Identify specific areas where savings will occur
 - Further it's a good way to develop and document management justification for the program.
- Walk before you run.
 - Frequently just paying closer attention to energy use and system understanding will result in short term savings at very low cost.
Better performance information in the right hands can be very powerful.
- Work with a qualified company.

Getting a program going and avoiding the pitfalls

- Pay attention to how the system will be deployed.
 - who's going to run it,
 - what information will be generated,
 - who is going to use the information and for what purpose
 - *how are the cost reduction measures going to get implemented?*
- Ensure that sufficient resources are allocated to operate, and maintain the system – this includes;
 - key metering
 - computing facilities
 - personnel